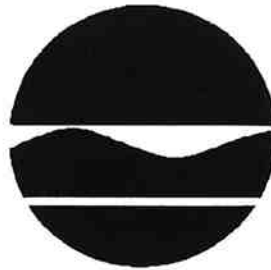


**SUPERFUND STANDBY PROGRAM  
New York State  
Department of Environmental Conservation  
50 Wolf Road  
Albany, New York 12233-7010**

**SITE ID 267: SALT CITY ENERGY VENTURE**

**SITE SUMMARY REPORT  
DRAFT**



**Onondaga Lake Project  
Task 5: 104(e) Review**

**Site No. 734030-002  
Work Assignment Number D003060-27**

Prepared by

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## **1.0 SITE DESCRIPTION**

The information referenced in this report was mainly obtained from the 104(e) response of Salt City Energy Venture (Company ID 2027), dated March 29, 1995. The supplemental information was based on NYSDEC's March 8, 1996 phone conversation with Salt City Energy Venture as documented in NYSDEC's March 21, 1996 letter to Salt City Energy Venture. Information obtained from other sources is noted, as necessary.

### **1.1 Location**

The Salt City Energy Venture facility (Site ID 267) is located at Industrial Drive in the Village of Solvay in Onondaga County, New York. The site encompasses approximately 16 acres and is located to the north of Milton Avenue, and to the south and east of a Conrail railroad line. Figure 1 shows the location of the facility in relation to Onondaga Lake. The facility occupies the western portion of the former AlliedSignal (Company ID 2010) Main Plant (Site ID 221), including areas used previously as the AlliedSignal boiler house, pump house, calcium chloride plant and storage area, and coal storage facility. An additional 3-acre parcel exists beyond the adjacent Conrail railroad tracks to the west near Bridge Street, and is used for power monitoring (Mailing No. 1, p. 000031). No other information regarding this 3-acre parcel was provided by Salt City Energy Venture. The site is shown on the USGS topographic map in Figure 2. A site plan provided by Salt City Energy Venture is included herein as Figure 3. The location of the site in relation to AlliedSignal's Main Plant is shown in Figures 4 and 5.

### **1.2 Geology**

The surficial geology of the Syracuse area was strongly influenced by the most recent glacial advance (Wisconsin age, 12,000 to 14,500 years ago). The area occupies a region that was

covered by Lake Iroquois, a large glacial lake situated in front of the ice margin. The broad flat-lying plains situated north from Syracuse to Lake Ontario were formed beneath Lake Iroquois and are characterized by lacustrine fine sand and silt deposits. Additional glacial features common to the region are moraines, drumlins, U-shaped valleys, and meltwater channels.

Onondaga Lake and all its major tributaries lie within glacial meltwater channels. These features originally were conduits carrying meltwater at large volumes and high velocities away from the glacier. Sediment types characteristically found in meltwater channels are sands and gravels. These relict features form important water bearing and transmitting units which form an irregularly branching, net-like pattern.

The bedrock geology of the greater Syracuse area includes Lower to Middle Paleozoic age sedimentary rocks predominated by carbonate (dolostone and limestone) and shale, and containing some sandstone, siltstone, and evaporites. Bedrock directly beneath the area (as well as underneath Onondaga Lake) is Silurian Vernon Shale (Rickard and Fischer, 1970) which has low permeability, but does possess secondary porosity due to fractures.

The soil type found on the Salt City Energy Venture site is described as urban land in the 1973 Onondaga County Soil Survey (USDA, 1973). This classification reflects an area which is so altered or obscured by urban works that an identification of the soils is not feasible. It is characterized by over 50 percent buildings or pavement. The Salt City Energy Venture site is directly underlain by fill consisting of coal chips, crushed stone, sand, fly ash, cinders, silt, bricks, and clay. The fill ranges in thickness from 3 to 20 feet (Dames & Moore, 1988, p. 5). The thickest fill exists within the central portion of the site. Underlying the fill in the central portion of the site is a lacustrine deposit of silty sand or sandy silt. At the site perimeter, the fill is underlain by a red clayey silt and silty clay till of hard consistency. The clay till may serve as a barrier between the perched and regional groundwater tables (Groundwater

Technology, 1985). Till and lacustine deposits were not found to coexist in any boring holes. A grayish green to dark gray shale bedrock underlies the lacustine deposits and till at a depth of 10 to 25 feet below the ground surface (Dames & Moore, 1989, p. 4).

### **1.3 Hydrogeology**

According to the Syracuse West USGS quadrangle, the ground surface elevation at the Salt City Energy Venture site is approximately 400 feet NGVD (see Figure 2). Groundwater is perched atop the till at a depth of 1 to 6.5 feet below grade (Dames & Moore, 1988, p. 5). This perched zone appears to thin eastward. In areas composed of fill and lacustine deposits, the groundwater levels range from 7 to 12 feet below grade. The direction of groundwater flow was not indicated by Salt City Energy Venture, however, the 1985 Groundwater Technology report prepared for AlliedSignal (formerly Allied Chemical) notes the direction of groundwater flow beneath the coal storage facility as north to northeast. Salt City Energy Venture is on an area of higher ground, and as shallow groundwater is expected to follow surface contours, groundwater is generally expected to flow in a northerly direction based on the ground surface contours (Figure 2).

### **1.4 Surface Water Hydrology**

Stormwater runoff from a portion of the Salt City Energy Venture site is discharged into a private industrial combined storm sewer owned by AlliedSignal and is authorized by a New York State Pollutant Discharge Elimination System (SPDES) permit (Permit No. NY-021-3586). The discharge point is located on the southeastern corner of the site, as shown in Figure 3. Subsequently this flow is commingled with flows from other facilities and ultimately is discharged directly to Onondaga Lake at AlliedSignal's Outfall No. 016 (Mailing No. 1, p. 000056). It should be noted that AlliedSignal's 1992 draft SPDES permit (Permit No. NY-

000-2275) indicates that this is Outfall No. 015 (see Table 2 and Figure 9 of the AlliedSignal Preliminary Draft Site Summary Report, TAMS, 1999).

The Salt City Energy Venture SPDES permit describes this discharge as runoff from “roof drains, parking areas, etc.” (Mailing No. 1, p. 000041). Runoff from the western portion of the Salt City Energy Venture site discharges into an off-site “channelized drainage ditch...located on the western end of the Allied site” and from there into Geddes Brook (Mailing No. 1, p. 000135). The location of the ditch and of the ditch’s discharge point into Geddes Brook were not identified by Salt City Energy Venture. However, this ditch is believed to be the West Flume, which flows under Bridge Street and through AlliedSignal’s Bridge Street site (Site ID 218) and discharges to Geddes Brook approximately one mile west of the Salt City Energy Venture site (see Figures 1 and 2). As shown in Figure 3, storage areas which may contribute to contaminated stormwater runoff include the coal pile, ash transfer area, and ash lagoon.

Salt City Energy Venture is in an area classified as “Flood Zone C,” or an area of minimal flooding (FEMA, Flood Insurance Rate Map, 1982).

## **2.0 SITE HISTORY**

### **2.1 Owners/Operators**

Salt City Energy Venture and HYDRA-CO Operations have been in operation at its current location on Industrial Drive in Solvay, New York, since May 12, 1992 until, at least, the date of the submittal (1995-1996) (Mailing No. 1, p. 000007). However, Salt City Energy Venture provided information which predated the commencement of their on-site operations. Specifically, there was a SPDES permit suspension in March 1991 (Mailing No. 1, p. 000069), and Salt City Energy Venture provided waste disposal information beginning in February 1991 (Mailing No. 1, pp. 000011-000017). It is likely that at least some of these wastes were generated during the decommissioning of AlliedSignal's facility and the construction of the Salt City Energy Venture facility. Salt City Energy Venture indicated that construction of the facility began in November 1989 (Mailing No. 1, p. 000007).

The property is leased from the Industrial Development Agency, who purchased the site from AlliedSignal in 1989. Salt City Energy Venture indicated in a phone conversation with NYSDEC that AlliedSignal possesses the records for the property prior to 1989 (NYSDEC, March 21, 1996). Information on this site for the period prior to 1989 can be found in the Preliminary Draft Site Summary Report for AlliedSignal (TAMS, 1999). Salt City Energy Venture is general partners with USEC-Salt City Power, Inc. and HYDRA-CO Generation, Inc., and limited partners with Energy Investors Fund, L.P. and HYDRA-CO Enterprises, Inc. (Mailing No. 1, p. 000006).

### **2.2 Site Operations**

The Salt City Energy Venture facility is a cogeneration facility which utilizes coal to generate electricity. The process flow diagrams that were provided (Mailing No. 1, pp. 000083 and



000181) are both mostly illegible. The facility processes, as described in Salt City Energy Venture's Mailing No. 1 (p. 000008), are listed below, and details regarding the types and quantities of wastes that have been generated are provided in Section 2.3.

- Coal is stockpiled in coal piles at the facility. The coal transportation and storage processes were not described.
- The coal is pulverized and then combusted by five boilers to produce steam. The pulverization process and location were not described.
- The steam is used to turn a turbine, thereby generating electrical power which is sold off-site. The generated electricity is also used to power the Salt City Energy Venture plant. Steam is extracted from the turbine for sale to several steam customers, or "hosts."

Salt City Energy Venture did not indicate their site operations had changed since 1992.

## **2.3 Generation and Disposal of Wastes**

The hazardous and non-hazardous wastes that have been generated from the operations discussed in Section 2.2 as well as from facility construction are listed below. Supporting documentation was provided by Salt City Energy Venture (e.g., laboratory reports, hazardous waste manifests, and shipping manifests) to identify the types and quantities of wastes that have been produced at their facility.

Non-Hazardous Wastes

- Ash waste is generated during boiler operations (bottom ash) and is filtered from the combined exhaust gas stream by the fabric filter bag house (fly ash). The ash is conveyed by a negative pressure system to a silo for storage, and then transported off-site for mine reclamation and beneficial use, such as road bed construction and sub-base backfill. Ash is transported dry or after conditioning with water and a surfactant. The surfactant type, composition, quantity used, and storage practices were not indicated. During shipment, loading and unloading, dry ash is transferred in a “tight fitting umbilical” under negative pressure. The chute that discharges the conditioned ash from the silo (see Figure 3 for location) extends to near the top of the railcar to limit wind dispersal during railcar loading. The conditioned ash may also be loaded into trucks and tarped. Based on submitted manifests and annual summary reports, the ash disposal areas are located in Pennsylvania and West Virginia (Mailing No. 1, pp. 000312-000343). In 1994, NYSDEC issued a Beneficial Use Determination for the use of Salt City Energy Venture’s coal bottom ash as road base and sub-base backfill material (Mailing No. 1, p. 000339). Based on Toxicity Characteristic Leaching Procedure (TCLP) testing for metals (Mailing No. 1, p. 000341), the samples of bottom ash and fly ash were considered non-hazardous. In 1994, fly ash was sent to facilities in Hamburg, New York and Canada for beneficial reuse and bottom ash was used by the New York State Thruway Authority. Approximately 48,000 tons of fly and bottom ash were removed from the Salt City Energy Venture site in 1994 (Mailing No. 1, p. 000313).
- Flue gas from the boilers is discharged and monitored in adherence to a permit issued by NYSDEC (Mailing No. 1, p. 000008). This permit was not included in the submittal. The number and location of the emission points were not indicated, nor were any sampling data provided.

- The coal combustion process produces emissions of sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic compounds and particulates. Monitoring for opacity, sulfur dioxide, nitrogen oxides, and carbon dioxide is required by the NYSDEC air emissions permit (Mailing No. 1, pp. 000018, 000298).
- Boiler blowdown is discharged to the sanitary sewer and monitored in adherence to a permit issued by the Onondaga County Department of Drainage and Sanitation (OCDDS) for industrial waste discharge (Mailing No. 1, p. 000019). The discharge location is shown on Figure 3 at the southeastern corner of the site. The OCDDS discharge is discussed in greater detail later in this section. This permit was not included in the submittal.
- Cooling tower blowdown, filter backwash, ion exchange rinse, and stormwater runoff are discharged to a privately-owned industrial combined facility storm sewer owned by AlliedSignal (Mailing No. 1, p. 000008). These flows are monitored prior to discharge to the AlliedSignal sewer as required by their SPDES permit. This permit is discussed in greater detail later in this section. AlliedSignal is responsible for monitoring the effluent immediately before discharge to Onondaga Lake.
- Waste oil resulting from equipment decommissioning was transported to permitted facilities in Tonawanda, New York for energy recovery and to Liverpool, New York for disposal (Mailing No. 1, pp. 000013, 000224-000241).
- Salt City Energy Venture has been transporting scrap steel since 1991 for recycling at Matlow Company Steel (Company ID 2065) and Roth Steel (Company ID 2008), both in Syracuse, New York (Mailing No. 1, pp. 000015, 000607-000608).

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- Facility trash, rubbish and recyclable office waste is continuously transported to the Onondaga County Ley Creek Transfer Station (construction and demolition debris) and to the Onondaga County Rock Cut Road Transfer Station (trash, burnable rubbish, recyclable paper board, and office paper) (Mailing No. 1, pp. 000013-000014).
- Lithium chloride wastes were generated by AlliedSignal and were disposed by Salt City Energy Venture during their operation of the facility. The source of the lithium chloride waste was not specified. Lithium chloride waste (110 gallons) was transported to a disposal facility in Liverpool, New York, in October 1993 (Mailing No. 1, p. 000017). The shipping manifest classifies this material as non-hazardous (Mailing No. 1, p. 000291).
- Soil disturbed during construction of the Salt City Energy Venture facility was either used as fill or redistributed around the site (Salt City Energy Venture Soil Testing Report to NYSDEC, 1989, p. 3). Based on analytical results of soil borings, the "aggregate concentrations of hazardous chemicals found at the site do not warrant treating the soils as hazardous waste" (Dames & Moore, 1988, p. 9). The layout of the plant complex and constructed structures was planned with respect to the geotechnical and soil chemistry information. The location of new Salt City Energy Venture structures was decided upon after additional testing was conducted to avoid disturbing potentially contaminated soils (Salt City Energy Venture Soil Testing Report to NYSDEC, 1989, pp. 2-3).

### Hazardous Wastes and Materials

Salt City Energy Venture did not indicate in their submittal that their operations generate any hazardous wastes. However, during construction and operation of the facility, Salt City Energy Venture disposed of hazardous wastes as discussed below. This information was obtained from hazardous waste manifests and generated waste summary tables that were created by Salt City Energy Venture (Mailing No. 1, pp. 000009-000017, 000242-000296). Waste types, disposal quantities, and disposal facilities are listed in Table 1.

- Polychlorinated biphenyl (PCB) wastes were discovered in transformer oil left on the property by AlliedSignal. The oil was drained from the transformers and disposed at USEPA-approved incinerators or decontamination facilities from 1991 through 1995 (Mailing No. 1, pp. 000016, 000243-000275). The transformers were refilled with non-PCB oil.
- During preparation for and construction of the Salt City Energy Venture facility, an unknown quantity of asbestos waste was disposed in a private landfill of unknown location owned by AlliedSignal (Mailing No. 1, p. 000014). During Salt City Energy Venture's operations, asbestos was disposed in several landfills from 1992 through 1995 (Mailing No. 1, pp. 000281-000290).
- Boiler refurbishment was a one-time event prior to commercial operation (Mailing No. 1, p. 000010). The cleaning wastes were transported to a USEPA-approved disposal site in February and March 1991. These wastes were identified as "cleaning wastes" and consisted of a hydrochloric acid solution (Mailing No. 1, pp. 000264-000265, 000267-000280).

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- Sodium hydroxide wastes were generated by AlliedSignal and were disposed during Salt City Energy Venture's operation of the facility. It was noted that the sodium hydroxide was stored in an on-site dike of unspecified dimensions and location (Mailing No. 1, p. 000010). Sodium hydroxide (110 gallons) was transported to a disposal facility in Wampsville, New York, in October 1991 (Mailing No. 1, p. 000017). The shipment manifest classifies this material as hazardous, corrosive waste (Mailing No. 1, p. 000296).

### Facility Permits

Salt City Energy Venture stated that they have been in compliance with permit limits and parameters for release of hazardous wastes, hazardous substances, or industrial wastes into the environment with very few exceptions, all of which have been reported and resolved to the satisfaction of NYSDEC (Mailing No. 1, p. 000018). Permits have been obtained for discharge into a private industrial combined storm sewer owned and monitored by AlliedSignal Corporation (NYSDEC), for air emissions (NYSDEC), and for discharge of boiler blowdown and sanitary wastewaters into the sanitary sewer (OCDDS).

Table 1: Summary of Disposal of Hazardous Wastes and Materials

Waste Type	Estimated Quantity <sup>1</sup>	Period of Disposal <sup>2</sup>	Disposal Site and Location
PCB wastes	149 kg	1992	S. D. Myers, Tallmadge, OH
	9,500 kg	1992	Aptus Environmental Services, Coffeyville, KS
	4,675 kg	1993	USPCI, Philadelphia, PA
	9,430 kg	1994	S. D. Myers, Tallmadge, OH
	1,137 kg	1995	CWM Chemical Services Model City, NY
Asbestos wastes <sup>4</sup>	Unknown	During Construction <sup>3</sup>	Private AlliedSignal landfill
	25 bags	1992	Valley Landfill, Irwin, PA
	15 cu. yd.	1993	Seneca Meadows Landfill, Waterloo, NY
	40 bags	1993	Valley Landfill, Irwin, PA
	40 bags	1993	PST Reclamation, Harwood, MD
	30 cu. yd.	1994	Seneca Meadows Landfill, Waterloo, NY
	125 drums	1994	Kelly Run Sanitation Elizabeth, PA
	3 bags	1994	S&S Landfill, Clarksburgh, VA
	182 bags	1995	PST Reclamation, Harwood, MD
	3 bags	1995	S&S Landfill, Clarksburgh, VA
	30 cu. yd.	1995	Seneca Meadows Landfill, Waterloo, NY

**Table 1: Summary of Disposal of Hazardous Wastes and Materials (Continued)**

Waste Type	Estimated Quantity <sup>1</sup>	Period of Disposal <sup>2</sup>	Disposal Site and Location
Cleaning wastes generated during boiler refurbishment	651,360 lb	1991	E.I. DuPont Chambers Works, Deepwater, NJ
Sodium Hydroxide	110 gal.	1991	Wampsville, NY

**Notes:**

1. Weights and volumes were obtained from Salt City Energy Venture Mailing No. 1 (pp. 000014-000017, 000244-000296).
2. 1989 is the date when the property was acquired from AlliedSignal. Facility operations began in 1992.
3. Construction began in 1989. Asbestos disposal during construction was performed by the contractor, Duke/Fluor Daniel. Dates and quantities are unknown to Salt City Energy Venture (Mailing No. 1, p. 000014)
4. Asbestos is listed as Hazardous Material in 49 CFR 172.101.

A SPDES permit was applied for in March 1987 for waste streams discharged from the site. The 1987 SPDES permit application (Mailing No. 1, pp. 000169-000194) listed one outfall (Outfall No. 001) consisting of cooling tower blowdown, ion exchange rinse, and activated carbon backwash, which were discharged continuously through the year to a private AlliedSignal industrial combined storm sewer (to AlliedSignal Outfall No. 015) (Mailing No. 1, p. 000160) and then to Onondaga Lake. The permit application was modified in May 1987 to include Outfall No. 002, for the discharge of stormwater runoff from the property (Mailing No. 1, p. 000158) as well as groundwater infiltration to an existing sewer (Mailing No. 1, p. 000165). Outfall No. 002 combined with another private AlliedSignal industrial combined storm sewer carrying stormwater from the Village of Solvay and proceeding to an unidentified location which is labeled "to Henley Group, Inc. and Allied Corp. Outfall 016 (Onondaga Lake)" (Mailing No. 1, pp. 000164-000165).

In February 1989, Outfall No. 002 was renamed as Outfall No. 001 and the former Outfall No. 001 was redirected to join the former Outfall No. 002 in discharge to the private AlliedSignal industrial combined storm sewer serving the Village of Solvay, Henley Group, Inc., and the inactive AlliedSignal Syracuse Works (again, sewer to AlliedSignal Outfall No. 016). A SPDES permit (Permit No. NY-021-3586) was issued for only one outfall (Outfall



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No. 001, AlliedSignal sewer to Outfall No. 016) in February 1989 (Mailing No. 1, p. 000129), because Outfall No. 002 (sewer to AlliedSignal Outfall No. 015) would no longer be under the ownership or control of Salt City Energy Venture (Mailing No. 1, p. 000085). This ownership change reflected changing site boundaries which excluded the private AlliedSignal industrial combined storm sewer serving the Village of Solvay from the property limits to avoid monitoring requirements for groundwater infiltration to the sewer, as negotiated in August 1987, and to avoid construction of a pump station (Mailing No. 1, pp. 000085, 000132).

The SPDES permit (NY-021-3586) was issued on February 1, 1989 with an expiration date of February 1, 1994. The permit was transferred from HYDRA-CO Enterprises to Salt City Energy Venture in October 1989 (Mailing No. 1, p. 000128). As discussed above, Salt City Energy Venture discharges through Outfall No. 001 to a private AlliedSignal industrial combined storm sewer (to AlliedSignal Outfall No. 016) which serves the inactive AlliedSignal Syracuse Works, the Henley Group, Inc. site, and the Village of Solvay (Mailing No. 1, p. 000164).

During construction excavation in 1990, the SPDES permit was amended to include the discharge of process wastewater. Groundwater which was pumped to lower the water table during construction excavations was discharged through Outfall No. 001A, which was discharged in conjunction with Outfall No. 001 to the private AlliedSignal industrial storm sewer (to AlliedSignal Outfall No. 016) (Mailing No. 1, p. 000118). The permit application notes that by prior agreement, AlliedSignal would remediate the groundwater in the vicinity of the new turbine building site, adjacent to the AlliedSignal boiler house site. The 1990 SPDES permit amendment stated that AlliedSignal intended to treat the groundwater and then discharge the treated effluent to the OCDDS sewer system (Mailing No. 1, p. 000122). Salt City Energy Venture treated groundwater from the other twelve excavation areas by sedimentation and equalization and carbon adsorption, and then discharged the effluent to the

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private AlliedSignal industrial combined storm sewer under their SPDES permit (Mailing No. 1, pp. 000096-000127).

Pursuant to a site inspection performed by NYSDEC on March 26, 1991, Salt City Energy Venture's SPDES permit was suspended (Mailing No. 1, p. 000069). The suspension was issued due to violations of the permit for failure to fully disclose all relevant facts regarding additional discharges, and construction of additional or unpermitted outfalls. The nature of the operations resulting in these unpermitted outfalls and discharges were not indicated, and it should be noted that Salt City Energy Venture did not begin operations until May 1992 (Mailing No. 1, p. 000004). The unpermitted outfalls cited were: overflow discharging to the storm sewer from the coal pile leachate retention pond; discharge to the storm sewer from the transformer retention basins' water treatment floor drains through a newly installed oil/water separator; discharge of boiler room floor drains to an undisclosed point; discharge of the chemical additive tanks' retention basin to an undisclosed point; and discharge of the oil storage tanks' retention basin to groundwater. The permit violations are discussed further in Section 4.1 of this report. In May and June 1991, the aforementioned outfalls were either capped or rerouted (Mailing No. 1, pp. 000062-000070).

The SPDES permit was renewed on May 4, 1994 and was valid until June 1, 1999 (Mailing No. 1, pp. 000032-000035, 000038-000042). Outfall No. 001 in this permit is for continuous discharge to the private AlliedSignal industrial combined storm sewer to Onondaga Lake. At the time of the submittal (1995), the total daily flow from the Salt City Energy Venture SPDES outfalls was approximately 200,000 gallons (Mailing No. 1, p. 000009). For monitoring purposes, Outfall No. 001 is divided into the following four outfalls: Outfall No. 001A for cooling tower blowdown and overflow; Outfall No. 001B for filter and activated carbon backwash; Outfall No. 001C for ion exchange backwash and rinse; and Outfall No. 001D for coal pile runoff pond overflow. Outfall No. 001E, which is listed on a sketch of monitoring locations (Mailing No. 1, p. 000041), consists of "stormwater from roof drains,

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parking areas, etc.” Not included in the permit is any stormwater from the western side of the property which drains off-site into the West Flume, a channelized drainage ditch that discharges into Geddes Brook. It was noted that all stormwater flows from the western side of the property “represent sheet flows, and therefore are not subject to any stormwater discharge permitting. The channelized drainage ditch . . . is not located within the property boundaries established for the Salt City Cogeneration Project” (Mailing No. 1, pp. 000135-000136). Discharge limitations for Outfalls 001 and 001A-001D, based on the most recent SPDES permit provided, are listed in Table 2. Monitoring data associated with the recent SPDES permit were not provided. Permit violations are summarized in Section 4.1 of this report. In addition to the parameters identified in Table 2, it was indicated (Mailing No. 1, p. 000018) that the SPDES permit prior to 1994 also required monitoring of select volatile and semi-volatile organic compounds, including benzene, chlorinated benzenes, toluene, xylene, and naphthalene. Results of the monitoring were submitted to NYSDEC but were not included in the submittal.

Effluent originating from the ion exchange system (Outfall No. 001C) is treated in a neutralization tank before discharge to the AlliedSignal sewer. The capacity of the neutralization tank, 35,000 gallons, is discharged every two days (Mailing No. 1, p. 000070). Waste streams from the regeneration of the cation and anion deionization system are first mixed in the tank, and then acid is added as required to reach the desired pH of 6.0 to 9.0. A dechlorination system was made available for Outfall No. 001A for cooling tower blowdown. As of March 29, 1995, this system had not yet been needed (Mailing No. 1, p. 000021) but was expected to go into service in the second quarter of 1995. Details of the dechlorination system were not provided. All other SPDES permitted discharges are not treated. It was indicated (Mailing No. 1, p. 000020) that sludges have not been generated by these treatment processes. However, the initial SPDES permit application (Mailing No. 1, pp. 000171-000172) indicates that the sludge from the phosphorus removal process is discharged to the OCDDS sewer.

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NYSDEC permits were issued to authorize air emissions from the facility. The permits were valid from January 1989 to July 1998 (Mailing No. 1, p. 000018) but were not included in the submittal. NYSDEC Fuel/Industrial Process Emission Surveys were submitted for 1992 and 1993 (Mailing No. 1, pp. 000297-000310), which reported the facility's sources of particulate emissions (coal unloading, ash conveying, and the bag house) as well as various types of fuels used by Salt City Energy Venture. For 1992, it was indicated (Mailing No. 1, p. 000298) that 385,000 tons of coal and 201,600 gallons of #2 fuel oil were used. Salt City Energy Venture indicated that the monitored parameters include opacity, sulfur dioxide, nitrogen oxides, and carbon dioxide (Mailing No. 1, p. 000018). The 1992 annual stack emissions ranged from 11 million pounds of sulfur dioxide, 5 million pounds of nitrogen oxides, 231,000 pounds of carbon monoxide, 200,000 pounds of particulates, and 27,000 pounds of volatile organics (Mailing No. 1, p. 000298). It was indicated (Mailing No. 1, p. 000009) that the annual air emission rate of regulated parameters is approximately 7,600 tons.

An OCDDS Industrial Waste Discharge permit was obtained for the discharge of boiler blowdown water, as well as sanitary sewage (Mailing No. 1, p. 000008). This permit was not included in the submittal. The dates of permit issuance and the permit number were not indicated. Prior to March 26, 1993, the blowdown effluent was discharged untreated, but was still in compliance with the OCDDS permit at the time (Mailing No. 1, p. 000021). In 1993, Salt City Energy Venture implemented pretreatment for the blowdown effluent before discharge. The reason for this was not indicated. The pretreatment consists of temperature reduction and pH adjustment by acid injection. Sludges are not generated from this pretreatment process. Boiler blowdown consists of "almost all" of the industrial waste discharge of 35,000 gallons per day to the OCDDS system (Mailing No. 1, p. 000021). Salt City Energy Venture did not submit any wastewater quality results.

**Table 2: Summary of SPDES Outfall Effluent Parameters and Limits**

Outfall Number and Description	Effluent Parameter	Maximum Daily Discharge Limitations
001 - Combined Final Discharge - Cooling Tower Blowdown and Overflow, Filter and Activated Carbon Backwash, Ion Exchange Rinse, Storm Runoff	Flow	-- <sup>1</sup>
	Copper, Total	0.34 mg/L
	Temperature	90°F
	pH	6.0-9.0
	Solids, Total Suspended	100 mg/L
	Oil and Grease	15 mg/L
001A - Cooling Tower Blowdown and Overflow	Chlorine, Free Available	0.2 mg/L
	Solids, Total Suspended	100 mg/L
	Zinc, Total	1.0 mg/L
	Oil and Grease	20 mg/L
	pH	6.0-9.0
001B - Filter and Activated Carbon Backwash	Chromium, Total	0.2 mg/L
	Copper, Total	1.0 mg/L
	Iron, Total	4.0 mg/L
	Solids, Total Suspended	100 mg/L
	Oil and Grease	20 mg/L
001C - Ion Exchange Backwash and Rinse	Chromium, Total	0.2 mg/L
	Copper, Total	1.0 mg/L
	Solids, Total Suspended	100 mg/L
	Oil and Grease	20 mg/L

**Table 2: Summary of SPDES Outfall Effluent Parameters and Limits (Continued)**

Outfall Number and Description	Effluent Parameter	Maximum Daily Discharge Limitations
001D - Coal Pile Runoff Pond Overflow	Flow	-- <sup>1</sup>
	Total: Aluminum; Chromium; Copper; Iron; Lead; Manganese; Nickel; and Zinc	-- <sup>1</sup>
	Solids, Total Suspended	100 mg/L
	Oil and Grease	20 mg/L
	pH (Range)	6.0-9.0

**Notes:**

1. The SPDES permit requires monthly monitoring for these parameters.
2. Parameters and limits obtained from the SPDES permit modified on February 2, 1995 (Mailing No. 1, pp. 000032 - 000042).

### **3.0 POTENTIAL PATHWAYS FOR RELEASE OF HAZARDOUS SUBSTANCES TO THE LAKE SYSTEM**

#### **3.1 Soil**

Soil on the Salt City Energy Venture site can be contaminated directly from on-site disposal of industrial wastes or spills from waste storage and handling areas. Salt City Energy Venture did not provide any analytical soil data for this site. Environmental sampling, including soil borings and samples, was performed prior to construction of the Salt City Energy Venture facility. A discussion of this data is provided in Section 4.2.

During removal of ash wastes from the facility there is potential for spills. Chemical analyses were conducted on fly and boiler ash waste (Mailing No. 1, pp. 000341-000343). Based on TCLP testing, all metals tested (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver) were below the current TCLP standards. Salt City Energy Venture received a Beneficial Use Determination from NYSDEC for use of coal bottom ash as road base and sub-base backfill material (Mailing No. 1, p. 000339).

#### **3.2 Surface Water**

The Salt City Energy Venture facility is located approximately 2,000 feet southwest of Onondaga Lake and 1,200 feet southwest of Tributary 5A. The location of the discharge point of the SPDES outfall to the private AlliedSignal industrial combined storm sewer is shown in Figure 3.

It is possible that stormwater runoff from the Salt City Energy Venture facility can reach the Onondaga Lake system, providing a potential pathway for off-site contamination. There are drainage system outfalls located on the southern side of the facility. The areas of the site as

shown in Figure 3 are potential sources of surface water contamination, including the coal storage pond, the ash lagoon and several materials transfer stations. In their 1993 SPDES renewal application, Salt City Energy Venture stated that “all floor drains are now routed to the facility leachate pond” (Mailing No. 1, p. 000049). These areas were not mentioned or described in the submittal. It was stated in the 1993 SPDES renewal application that “Salt City Energy Venture discharges no runoff or leachate from storage or disposal areas” (Mailing No. 1, p. 000049). Discharge monitoring reports associated with their SPDES permit were not provided.

Stormwater from the western portion of the site is described in a 1988 letter from HYDRA-CO to NYSDEC as representing sheet flows and therefore “not subject to any stormwater discharge permitting” (Mailing No. 1, p. 000135). It was stated that this outfall was listed on the Salt City Energy Venture water balance and discharges to Geddes Brook through an off-site AlliedSignal channelized drainage ditch to the west (Mailing No. 1, pp. 000135-000136), known as the West Flume. The water balance was included in the Salt City Energy Venture submittal as part of the SPDES permit applications but was illegible (Mailing No. 1, pp. 000083, 000181). This stormwater from the western portion of the site is unregulated and could contain contaminants from spills or previously contaminated soil.

### **3.3 Groundwater**

Groundwater sample data were provided from an analysis performed prior to construction excavation (Mailing No. 1, pp. 000096-000111). These data were obtained in 1988 and 1989, prior to Salt City Energy Venture’s on-site operations. Of the volatile and semi-volatile organic compounds tested for, the maximum values detected were in the location of the boiler house, which was to be remediated by AlliedSignal and where no major excavations were planned (Mailing No. 1, p. 000122). All other extracted groundwater was treated by Salt City Energy Venture during construction with a carbon adsorption system and discharged to



the AlliedSignal sewer system (Mailing No. 1, p. 000111). The extent of groundwater contamination due to AlliedSignal historic operations is discussed in Section 4.2.

Groundwater beneath the Salt City Energy Venture site can be contaminated by migrating leachate which travels through on-site accumulated waste or stored materials. Salt City Energy Venture stated in their 1993 SPDES renewal application that "Salt City Energy Venture discharges no runoff or leachate from storage or disposal areas" (Mailing No. 1, p. 000049), however, there has been at least one coal pile storage pond overflow (Mailing No. 1, p. 000069), and the ash lagoon and transfer facilities (Figure 3) were not addressed in Salt City Energy Venture's submittal.

There is also the possibility of groundwater contamination by leachate migration through previously contaminated soil. The off-site migration of contaminants in groundwater is addressed by an anticipation "that groundwater downgradient of the site will be treated before reaching any significant receptor, [and] solid concentration levels may not present a significant problem" (Dames & Moore, 1988, p. 10). The treatment methods, locations, and parties responsible for groundwater treatment were not discussed. It was noted that the clay till may serve as a barrier which will prevent contaminants from reaching the groundwater (Groundwater Technology, 1985).

### **3.4 Air**

Air emissions represent a local source of contaminants to the atmosphere with potential deposition to the ground surface and subsequent transport to Onondaga Lake via surface runoff. The coal combustion process produces emissions of sulfur dioxide, nitrogen oxides, carbon monoxide, and volatile organic compounds (Mailing No. 1, p. 000298). On-site ash and coal operations produce particulate matter (Mailing No. 1, p. 000309) which can be transported by wind and deposited throughout the watershed. The release of particulates to

the atmosphere is limited by the use of negative pressure ash transportation and dust controlling foam (Mailing No. 1, pp. 000301, 000312). The foam composition, storage practices, and quantity of foam used were not indicated.

Air emission test results were not submitted, nor were any permits regarding emissions. NYSDEC Fuel/Industrial Process Emissions Surveys for the years 1992 and 1993 were submitted (Mailing No. 1, pp. 000297-000310), and provide information regarding the types of emissions from the combustion process. A summary of the 1992 fuel usage and stack emissions is provided in Section 2.3 of this report.

### **3.5 County Sewer System**

Salt City Energy Venture discharges industrial wastewater (boiler blowdown) and sanitary wastewater to the OCDDS system for final treatment at the Metropolitan Syracuse Wastewater Treatment Plant (Mailing No. 1, p. 000019). The OCDDS permit was not submitted. The boiler blowdown is treated by temperature reduction and pH adjustment by acid injection (Mailing No. 1, p. 000021). These treatment methods were initiated on March 26, 1993. Prior to boiler blowdown pretreatment, effluent was discharged to the sanitary sewer system untreated but in compliance with the OCDDS permit. Wastewater data were not provided by Salt City Energy Venture. It is believed that stormwater discharges from the site have been conveyed to AlliedSignal's storm sewers and drainage channels (see Sections 2.3 and 3.2). However, it is possible that some contaminated stormwater may have also been discharged to the municipal sewer system. As noted earlier, a project water balance provided as part the original SPDES permit application was illegible (Mailing No. 1, pp. 000083, 000181).

#### **4.0 LIKELIHOOD OF RELEASE OF HAZARDOUS SUBSTANCES TO THE LAKE SYSTEM**

##### **4.1 Documented Releases**

###### Documented Spills

It was indicated by Salt City Energy Venture that they have been in compliance with SPDES permit limits for permitted parameters with very few exceptions (Mailing No. 1, p. 000018). Table 3 presents reported SPDES violations as documented by Salt City Energy Venture.

In addition to the violations noted in Table 3, a settlement in 1992 against Salt City Energy Venture was made with NYSDEC for an unpermitted discharge of pollutants from the condenser hotwell to the equalization basin on May 31, 1991 (Mailing No. 1, pp. 000049, 000197). Iron concentrations exceeded the SPDES permitted level of 4.0 mg/L (daily maximum). The unpermitted discharge was not reported to NYSDEC as required in the permit. Also, on June 26, 1991, an unpermitted discharge of fuel oil occurred to the facility's storm sewer (Mailing No. 1, p. 000197). Both violations were negotiated and settled without litigation. As noted earlier, Salt City Energy Venture operations did not start until May 1992 (Mailing No. 1, p. 000007), so it is unclear what operations resulted in these violations. The nature of Salt City Energy Venture operations, other than facility construction, prior to this date was not indicated by Salt City Energy Venture.

Reports of Noncompliance Events for each reported SPDES violation noted in Table 3 were provided by Salt City Energy Venture. The free chlorine discharged on June 15, 1994 was dismissed as a false test result by Salt City Energy Venture, citing no chlorine addition to the tower in the previous two weeks (Mailing No. 1, p. 000213). The total suspended solids (TSS) violations on July 7, 1994 and August 25, 1994 were attributed to storm events, and

**Table 3: Summary of Reported SPDES Violations**

Date	Parameter in Violation	Concentration (mg/L)	Permit Discharge Limit (mg/L)
May 5, 1994	TSS	330	100
May 5, 1994	Iron	6.6	4.0
May 26, 1994	Oil and Grease	35	15
May 26, 1994	TSS	140	100
June 15, 1994	Free Chlorine	0.26	0.2
July 7, 1994	TSS	240	100
August 25, 1994	TSS	900	100
December 7, 1994	Oil and Grease	23	15
January 5, 1995	Zinc	1.2	1.0
January 20, 1995	Zinc	1.1	1.0

Source: Mailing No. 1, pp. 000206-000221

corrective regrading and installation of a catch basin were planned (Mailing No. 1, pp. 000209, 000212). The discharges of elevated oil and grease and TSS concentrations on May 26, 1994 are listed as having an “undetermined cause,” however, the location is listed as “Outfall 001, Storm Event” (Mailing No. 1, p. 000217). The May 5, 1994 discharge of elevated concentrations of TSS and iron and the December 7, 1994 discharge of oil and grease were also from “undetermined causes,” and no corrective actions were taken. Periodic sampling was instituted, and sample accuracy was to be verified (Mailing No. 1, pp. 000208, 000218). In response to the January 5, 1995 and January 20, 1995 zinc level exceedances, a “modified NYSDEC approved water treatment program was instituted” (Mailing No. 1, p. 000207). This treatment process was not discussed in the submittal.

Salt City Energy Venture received notice of SPDES permit suspension on March 29, 1991. Several violations of the SPDES permit were cited in the letter, primarily dealing with unreported discharges as noted by NYSDEC during a March 1991 facility inspection. There were several unpermitted outfalls cited, including overflow discharge to the storm sewer from

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the coal pile leachate retention pond, discharge to the storm sewer from the transformer retention basin's water treatment floor drains by a newly installed oil/water separator and possible other sources, discharge to an undisclosed point from the boiler room floor drains, discharge to an undisclosed point from the chemical additive tanks' retention basin, and discharge of the oil storage tanks' retention basin to groundwater (Mailing No. 1, p. 000069). These outfalls were to be capped or rerouted into the system after a May 3, 1991 meeting with NYSDEC (Mailing No. 1, p. 000067). The length of time that these unpermitted discharges existed prior to the March 1991 site inspection was not indicated. It was not noted when the permit was reinstated.

While negotiating the elimination of the unpermitted outfalls after the permit suspension, NYSDEC requested a permit modification to include possible discharge from the coal pile runoff retention basin in the event of a 100 year, 24 hour storm. Salt City Energy Venture indicated that the coal pile retention basin has a "capacity of several times that required for a 10 year/24 hour storm" (Mailing No. 1, p. 000067). Further information regarding the resolution of this conflict was not included in the submittal. Salt City Energy Venture's recent SPDES permit indicates that Outfall No. 001D consists of overflow from the "coal pile runoff pond" (Mailing No. 1, p. 000040).

### Ongoing/Recent Releases

As discussed in Sections 2.3 and 3, ongoing releases from the site include releases to the atmosphere from air emission sources, discharge of treated and untreated process wastewater and runoff into the private AlliedSignal industrial combined storm sewer, discharge of stormwater to the off-site drainage ditch (West Flume), and discharge of treated process wastewater and sanitary wastewater into the OCDDS sewer system.

## **4.2 Threat of Release to the Lake System**

### **4.2.1 Extent of Site Contamination**

Based on the material submitted by Salt City Energy Venture, no evidence is available that suggests that site contamination (soil and groundwater) resulted from Salt City Energy Venture operations. Soil and groundwater sampling data were not provided in the Salt City Energy Venture mailing. However, previous occupancy by AlliedSignal has resulted in site contamination. The reports received from NYSDEC, including Groundwater Technology's Coal Storage Facility Groundwater Protection Program Report for Allied Corporation (September 1985); Blasland & Bouck's Coal Storage Facility Soil Boring and Analysis Program Proposal (September 1986) and Coal Storage Boring Program Report for Allied Corporation (December 1986); NYSDEC's Salt City Energy Venture Soils Information Submission (September 1989); and Dames & Moore's Report of Findings: Environmental Sampling for Salt City Cogeneration Project for HYDRA-CO/Salt City Energy Venture (February 1988, August 1989 and October 1989) provide soil and/or groundwater analytical results based on sampling performed prior to Salt City Energy Venture operations.

Three site investigations were performed by AlliedSignal and HYDRA-CO prior to Salt City Energy Venture operations, including soil sampling at AlliedSignal's Coal Storage area (outdoors) in 1986, soil and groundwater sampling at AlliedSignal's North Boiler House in 1987, and soil and groundwater sampling at AlliedSignal's North Boiler House and North Turbine Generator Building in May 1989. The areas sampled now comprise the Salt City Energy Venture site, as shown in the 1987 AlliedSignal site map (Figure 5). The results of these investigations, including limited data tabulations, are included in the Preliminary Draft Site Summary Report for AlliedSignal (TAMS, 1999). Summaries of these soil and groundwater investigations are provided below.

## Soil

Analysis of soil samples collected from the Coal Storage area (Blasland & Bouck, 1986) indicate elevated levels of sulfate and iron concentrations in soil leachate from Extraction Procedure (EP) Toxicity tests as compared to NYSDEC Class GA groundwater standards. In addition, pH levels were below the acceptable NYSDEC Class GA groundwater range. Analysis of metals in the Coal Storage area, based on EP toxicity testing, indicates that the soil is non-hazardous.

Based on samples collected by Dames and Moore in the vicinity of the North Boiler House and the North Turbine Building, it was determined that the fill, consisting of coal, cinders, sand, and gravel, exhibited odors which "could not be differentiated between that of fuel oil and other types of organic odors" (Dames & Moore, 1989, p. 4). White ash was detected in a boring near the Boiler House at a depth of 8 to 12 feet. This material was identified as "Solvay waste" by Allied personnel and was reported to be a soda ash by-product (Dames & Moore, 1989, p. 4). Analytical results for these borings reported pH levels between 7.4 and 12. Low levels of acetone were found in two of the borings. Semi-volatile organic compounds were detected which were categorized as polynuclear aromatics (PNAs) associated with coal tars and heavy hydrocarbons. PCBs were detected in residues and oily soils at concentrations up to 35.2 mg/kg associated with transformers in the Boiler House (Dames and Moore, 1988, Table 7). PCBs were not detected in surface soil samples from three of the borings. As indicated in Section 2.3, Salt City Energy Venture remediated PCB-contaminated transformers. It was concluded that there were low levels of contamination in the soils and that excavated soils would not be listed as hazardous waste (Dames & Moore, 1989). It should be noted that soil concentrations of benzene and toluene in borings collected in 1987 from the site area exceeded NYSDEC recommended soil cleanup objectives. It is likely that some of this contamination resulted from AlliedSignal's former chlorobenzene

wastewater line. The "Chlorobenzene Hot Spot Area" is being investigated by AlliedSignal as part of the ongoing Willis Avenue Site RI/FS (O'Brien & Gere, 1999).

### Groundwater

Based on the material submitted, there is no discernable groundwater contamination resulting from Salt City Energy Venture operations. Although it appears that groundwater sampling was not conducted by Salt City Energy Venture during their period of operation, the necessity of AlliedSignal remediation of groundwater during construction excavation, as discussed in Section 2.3, would indicate the likelihood that there was contaminated groundwater on-site. The presence of PCB-contaminated oils and soils on the site detected prior to Salt City Energy Venture operations would indicate the possibility of additional contamination resulting from AlliedSignal (Mailing No. 1, pp. 000243-000260). PCB data in subsurface soil or groundwater samples were not included in the reports.

AlliedSignal's outdoor Coal Storage area was a source of groundwater contamination. At the time of sampling, there was a retaining wall partially circling the soft coal area which served to prevent runoff from migrating off-site. Beneath the Coal Storage area there exists a thick clay till, as discussed in Section 1.2, which served to prevent leachate from vertical (downward) migration. The presence of a perched water table is noted in the 1985 Groundwater Technology report as "representative of surface water rather than a regional groundwater system," (p. 6) which is present under the clay level and untouched by the coal leachate. Based on a hydrogeologic investigation conducted in 1985, elevated levels of chlorides, sulfates, iron, zinc, and aluminum were detected in the perched groundwater beneath the Coal Storage area (Groundwater Technology, 1985).

Groundwater contamination resulting from AlliedSignal operations was summarized as low level contamination, and represented a "potential development concern" (Dames & Moore,



1989, p. 10). Precautions during excavation, such as monitoring of materials and dust, were recommended to promote a safe working environment for construction workers. Based on groundwater sampling conducted in May 1989 in the vicinity of the North Boiler House and North Turbine Generator Building, samples exceeded NYSDEC Class GA groundwater standards for iron, manganese, chloride, and sulfate (Dames & Moore, 1989, p. 9). Concentrations of zinc and aluminum also exceeded groundwater standards based on sampling in 1985. Select volatile organic compounds (chloroform and bromodichloromethane) were detected in 1989 in groundwater from one boring to the southwest of the North Boiler House. Semi-volatile organic compounds (naphthalene, phenanthrene, fluoranthene, pyrene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, and benzo(a)anthracene) were detected in two borings to the west and northwest of the Boiler House at concentrations that exceeded NYSDEC's Class GA groundwater standards (Dames & Moore, 1989). As mentioned in Section 3.3, the assumption that groundwater would be treated downgradient of the site precluded any on-site soil remediation (Dames & Moore, 1988, p. 10).

Additional discussion of soil and groundwater contamination and tabulation of data are included in the Preliminary Draft Site Summary Report for AlliedSignal (TAMS, 1999).

#### Surface Water/Sediment

The SPDES permits that have been in place from February 1, 1989 to June 1, 1999 required monitoring for copper, chlorine, zinc, chromium, iron, TSS, oil and grease, pH, flow, and temperature in their outfall to AlliedSignal's sewer that ultimately discharges to Onondaga Lake. In addition to these parameters, the first Salt City Energy Venture SPDES permit (valid between February 1, 1989 and February 1, 1994) also required monitoring for benzene, chlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,2,4-trichlorobenzene, toluene, xylenes, and naphthalene (Mailing No. 1, p. 000018). The only

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permit violations (based on the information provided) were for TSS, iron, oil and grease, free chlorine, and zinc (see Table 3). The majority of the SPDES permit violations were caused by storm events or process upsets, however, the 1991 permit suspension discussed in Section 4.1 resulted from improper discharge procedures and failure to notify NYSDEC of permit violations.

Salt City Energy Venture's Outfall No. 001 (the combined final outfall to the AlliedSignal industrial combined storm sewer to AlliedSignal Outfall No. 016) is limited to a maximum temperature of 90°F, maximum TSS concentration of 100 mg/L, maximum oil and grease concentration of 15 mg/L, and a pH between 6.0 and 9.0. The flow is to be monitored continuously (Mailing No. 1, p. 000035). Discharge monitoring reports were not submitted, therefore violations of permit limits could not be confirmed. All information regarding violations was taken from NYSDEC non-compliance reports submitted by Salt City Energy Venture, as discussed in Section 4.1.

The stormwater from the western portion of the Salt City Energy Venture site is discharged to an off-site channelized drainage ditch located on the western end of the AlliedSignal Main Plant site (West Flume), that flows into Geddes Brook (Mailing No. 1, p. 000135). This "sheetflow" may contain contaminants from areas on the western portion of the Salt City Energy Venture site, including the warehouse, meter house, and yard house as well as the 3-acre parcel for "power monitoring" identified in Figure 3 (the boundaries of this portion of the site are shown in Figure 4). Site runoff to the West Flume may also include the area near the equalization pond, the condenser tank, the water treatment room, and the turbine generator room (as shown in Figure 3). These areas contain some of the more contaminated soil borings (Dames & Moore, 1988) and contaminants may be transported off-site via surface water flow.

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As part of the AlliedSignal LCP Bridge Street (Site ID 218) Remedial Investigation (RI), sediment and surface water samples were collected in the West Flume, upstream, adjacent to, and downstream of the AlliedSignal Bridge Street site (NYSDEC/TAMS, 1998, based on Gradient/Parsons, 1997). The AlliedSignal Bridge Street site is downstream of Bridge Street along the West Flume and, thus, downstream of Salt City Energy Venture. The upstream sediment/surface water location (SD13/SW13), which was 300 feet upstream of the East Ditch on the AlliedSignal Bridge Street site or approximately 400 feet downstream of Bridge Street (and thus downstream of Salt City Energy Venture), was considered the "background" station for the AlliedSignal Bridge Street site RI. A shallow (SD13A, 0 - 0.5 feet) and deep (SD13B, 0.5 - 2.0 feet) sediment sample and a surface water sample were collected in 1995 at this location. In the RI, samples adjacent to and downstream of the Bridge Street site were compared to the background sediment samples. The sediment samples (shallow and deep) at the upstream station (downstream of Salt City Energy Venture) exhibited maximum detections of PCBs (42 ppb), mercury (0.6 ppm), arsenic (13.6 ppm), copper (67 ppm), lead (85 ppm), nickel (21 ppm), zinc (137 ppm), phenols (1.2 ppm) and PAHs, including, but not limited to, benzo(a)anthracene (1.8 ppm), benzo(a)pyrene (2.6 ppm), benzo(b)fluoranthene (3.3 ppm), fluoranthene (4.6 ppm), and pyrene (3.9 ppm), among others (Table 4.2-7a of the AlliedSignal Bridge Street Site RI, NYSDEC/TAMS, 1998).

Table 4.2-5a of the AlliedSignal Bridge Street site RI compares shallow sediment data in the West Flume adjacent to and downstream of the Bridge Street site to the upstream shallow station (SD13A). Of the compounds that were detected at station SD13A, concentrations of many PAHs and PCBs were detected at slightly higher concentrations downstream in the West Flume compared to the background station. Mercury was detected at a much greater concentration (29 ppm) downstream compared to the shallow background station (0.6 ppm). Table 4.2-6a of the RI compares deep sediment data in the West Flume to the upstream deep station (SD13B). Similar to the shallow stations, the deep sediment stations also exhibited slightly higher PAH concentrations downstream compared to the background station.

Concentrations of PCBs (320 ppb) and mercury (48 ppm) in the downstream stations were much greater than the background deep station (42 ppb for PCBs and 0.6 ppm for mercury in SD13B).

It should be noted that the mercury concentration in the background sediment sample (0.6 ppm) is greater than the NYSDEC Low Effect Level (LEL) of 0.15 ppm for mercury, but less than the Severe Effect Level (SEL) of 1.3 ppm. It is likely that detections of PAHs and metals, including mercury, in the “background” station in the West Flume were related to historic AlliedSignal operations (from either the Bridge Street site or the Main Plant) and not Salt City Energy Venture operations. However, zinc, which was noted in Salt City Energy Venture’s SPDES permit violations, was detected at concentrations (122 ppm in SD13A and 137 ppm in SD13B) in the background station greater than the NYSDEC LEL of 120 ppm but less than the SEL of 270 ppm. Zinc was also detected downstream in the West Flume at concentrations ranging from 59 ppm to 178 ppm (Table 4.2-7a of the RI).

Surface water data from the West Flume were also presented in the AlliedSignal LCP Bridge Street RI (Table 4.2-2a). The background station (SW13) did not exhibit elevated levels of contaminants that would have been related to Salt City Energy Venture operations. Many parameters were either not detected in the background water sample (volatile and semi-volatile organics and pesticides/PCBs) or were less than the downstream concentrations (most inorganics). Since zinc data were not presented in this table, it is assumed that zinc was not detected in the three West Flume surface water samples.

### Sewer Discharges

As stated in Section 2.3, sanitary wastewater and boiler blowdown wastewater have been discharged to the OCDDS system. The OCDDS permit, application, and Notices of Violation, if any, were not included in the submittal. Prior to discharge, the boiler blowdown

wastewater is treated by temperature reduction and pH adjustment (Mailing No. 1, p. 000021). Monitoring parameters and effluent quality data were not included in the submittal.

#### **4.2.2 Migration Potential of Contaminants**

Salt City Energy Venture operations have produced contaminants such as total suspended solids, oil and grease, iron, and zinc in discharges to the private AlliedSignal industrial combined storm sewer. These contaminants have potential to reach the Onondaga Lake system via surface water runoff, unpermitted discharges, or through spills. Stormwater from the western portion of the site to the West Flume, which is not part of the SPDES permit, is also a potential source of off-site contamination to the Onondaga Lake system.

AlliedSignal operations at the site prior to Salt City Energy Venture operations have impacted site soils and groundwater. Contaminated soils are a source of concern due to their potential effects on groundwater and off-site migration. No additional information was provided regarding the statement on page 9 of the Dames & Moore 1989 report that “groundwater downgradient of the site will be treated before reaching any significant receptor.”

## **5.0 POTENTIAL FOR ADVERSE IMPACTS TO LAKE SYSTEM DUE TO A RELEASE OR THREAT OF A RELEASE**

### **5.1 Hazardous Substance Characteristics**

Based on the information provided, wastes produced by Salt City Energy Venture's operations are industrial wastes and are non-hazardous. As indicated in Section 2.3, hazardous wastes disposed by Salt City Energy Venture (see Table 1) were generated prior to their commencement of operations in 1992. The non-hazardous wastewater generated on-site includes contaminants released to the private AlliedSignal industrial combined storm sewer, such as oil and grease, iron, zinc, total suspended solids, and chlorine. Concentrations of these parameters in their SPDES discharge exceeded permit limits on at least one occasion (see Table 3). However, as indicated in Section 4.1, corrective measures and additional sampling were implemented to reduce or eliminate exceedances. Thus, as these exceedances were not excessive (except for TSS) and not frequent, a discussion of hazardous substance characteristics is not included herein.

### **5.2 Quantity of Substances**

Estimates of the quantities of wastes released to the private AlliedSignal industrial combined storm sewer through Outfall No. 001 are provided in the 1987 SPDES permit application (Mailing No. 1, pp. 000169-000184). These parameters include TSS, residual chlorine, arsenic, cadmium, chromium, copper, mercury, selenium, silver, zinc, phosphorus, and sulfate. Effluent characteristics were provided in terms of pollutant concentrations and mass loadings. Mass loadings were based on a flow of 543,000 gallons per day (gpd) or 377 gallons per minute (gpm). Approximately 65 percent (246 gpm) of this flow originated from the cooling tower blowdown, approximately 29 percent (110 gpm) from ion exchange regeneration, and the remaining 6 percent (21 gpm) from filter and activated carbon

backwash as well as roof and site drainage based on a 10-year storm. Average mass loadings for these parameters were all estimated to be less than 1 pound per day (lb/day) except for phosphorus (less than 3 lb/day) and sulfate (approximately 5,000 lb/day). The flows at the time of the SPDES permit exceedances were not provided in the "Reports of Noncompliance Events" and, thus, loadings could not be estimated. The current SPDES permit (1994 to 1999) does not specify discharge (flow) limitations. In addition, loadings to the OCDDS sanitary sewer system from boiler blowdown wastewater (see Sections 2.3 and 3.5) were not estimated as neither flow nor concentration data for this discharge were provided by Salt City Energy Venture.

### **5.3 Levels of Contaminants**

The extent of on-site soil and groundwater contamination based on reports provided by NYSDEC was discussed in Section 4.2. These investigations (1986 to 1989) were conducted prior to Salt City Energy Venture operations at the site. A more detailed summary and tabulation of the data are provided in the Preliminary Draft Site Summary Report for AlliedSignal (TAMS, 1999). The only on-site analytical data provided by Salt City Energy Venture for their operations were those related to the SPDES permit. Permit limit concentrations and exceedances are indicated in Tables 2 and 3, respectively. Air emissions concentration data and analyses of industrial wastewater discharged to the OCDDS system were not included in the submittal. Annual stack emission loadings were presented in Section 2.3.

### **5.4 Impacts on Special Status Areas**

According to the Syracuse West National Wetlands Inventory map (USDOI, 1978), a small federal wetland exists approximately 300 ft northwest of the Salt City Energy Venture site and is designated as PEM1E (Palustrine, Emergent, Persistent, Seasonal Saturated). Penn

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Central rail tracks separate the site from this wetland. A second federal wetland is located approximately 1,000 ft northeast of the site and is designated as POWKZhs (Palustrine, Open water, Artificial, Intermittently Exposed/Permanent, Diked/Impounded, Spoil). This wetland area is AlliedSignal's Semet Residue Ponds site. The three nearest New York State freshwater wetlands are approximately 2,500 ft northwest of the site along the West Flume (SYW14), 4,000 ft east of the site near the East Flume and Harbor Brook (SYW19), and 3,000 ft west of the site near Geddes Brook (SYW15). Except for state wetland SYW15, each of these state and federal wetland areas are located downgradient of the Salt City Energy Venture facility.

As of August 1996, the New York State "Natural Heritage Sensitive Element" nearest to the Salt City Energy Venture facility was located approximately 1.9 miles northwest of the site, adjacent to Ninemile Creek and upstream of the confluence with Geddes Brook. It is not likely that this area would be affected by contamination from the Salt City Energy Venture site.

The West Flume and East Flume near the site do not have surface water classifications as per 6 NYCRR Part 895.4. Class C standards, as a default, would likely apply to these waterbodies.



## 6.0 SUMMARY OF CONCERNS

Based on the data and information provided by Salt City Energy Venture and NYSDEC, the following concerns are identified:

- The private AlliedSignal industrial combined storm sewer (to AlliedSignal Outfall No. 016 to Onondaga Lake) and the OCDDS sanitary sewer system are the primary discharge outlets of industrial wastewaters from the Salt City Energy Venture site. Except for limited data associated with violations of the SPDES permit, discharge monitoring data for both waste streams were not provided by Salt City Energy Venture.
- OCDDS sewer discharge permits and NYSDEC air permits were not included in the submittal. While there may have been no violations during Salt City Energy Venture's period of operation, these permits are of interest as they typically provide monitoring information, discharge limits, and process information.
- The release of stormwater from the western portion of the Salt City Energy Venture site to the West Flume, not covered under the SPDES permit, is a potential source of off-site contamination. The extent of the "western portion" of the site was not described. Although the majority of the western portion of the site consists of a warehouse, there is an equalization pond, condensate tank, water treatment room and turbine generator room located near the center of the site (Figure 3). These are areas from which spills or leaks might have occurred, as well as areas with contaminated soil resulting from historic AlliedSignal operations near the center of the site. The West Flume, downstream of Bridge Street, was sampled in 1995 as part of the AlliedSignal Bridge Street RI (NYSDEC/TAMS, 1998). The RI "background" sample location, which was just downstream of Bridge Street and thus

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downstream of Salt City Energy Venture, exhibited low levels of PAHs, PCBs, and metals. Concentrations of many of these parameters in the background station were less than the downstream samples in the West Flume affected by contamination from the AlliedSignal Bridge Street site.

- A leachate pond was mentioned in the submittal as a receptor for runoff. The location of the pond and the source and quality of the runoff were not indicated. Also not mentioned in the submittal but identifiable on the site map (Figure 3) is the ash lagoon, which could be a potential source of contaminated water overflow. The nature and purpose of this lagoon were not described. Based on SPDES violations resulting from coal pond overflow, the specifications of the pond and any corrective actions implemented should be evaluated.
- It was mentioned on page 10 of Dames & Moore's 1988 Report of Findings that "because it is anticipated that groundwater downgradient of the site will be treated before reaching any significant receptor, soil concentration levels may not present a significant problem." As previously discussed, contaminated leachate and groundwater from the site are potential sources of off-site contamination. The parties responsible for collection and treatment of contaminated groundwater and the length of time needed for treatment were not indicated. Groundwater data collected in this area subsequent to the 1989 investigation, if available, were not provided.
- The "block building for power monitoring" and 3-acre parcel to the west of the site near Bridge Street were not mentioned in the submittal except on a site map provided by Salt City Energy Venture (Figure 3). This area is shown on AlliedSignal's 1992 site map (Figure 4). The purpose and condition of this parcel were not indicated, nor was this area included in the site investigation reports

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provided by NYSDEC. Any available information relevant to the parcel's effects on the Onondaga Lake system should be evaluated.

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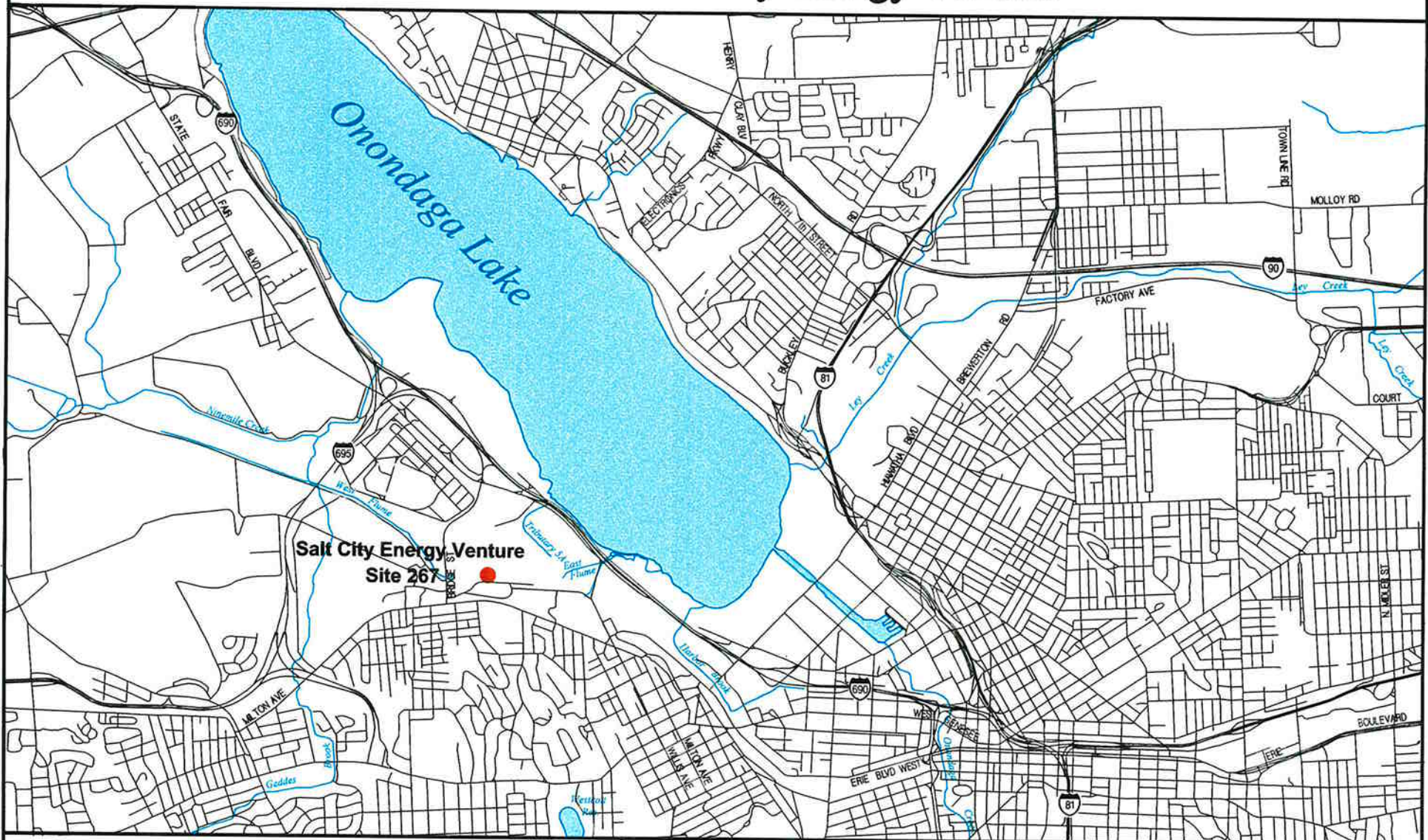
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# Site Location: Salt City Energy Venture



● Site Location

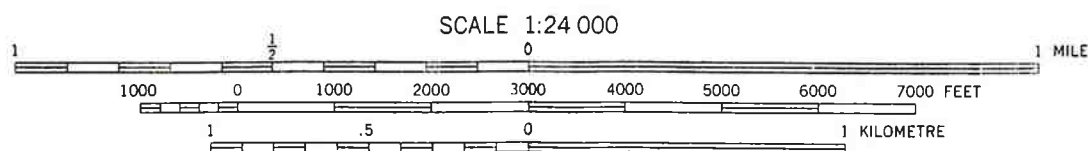
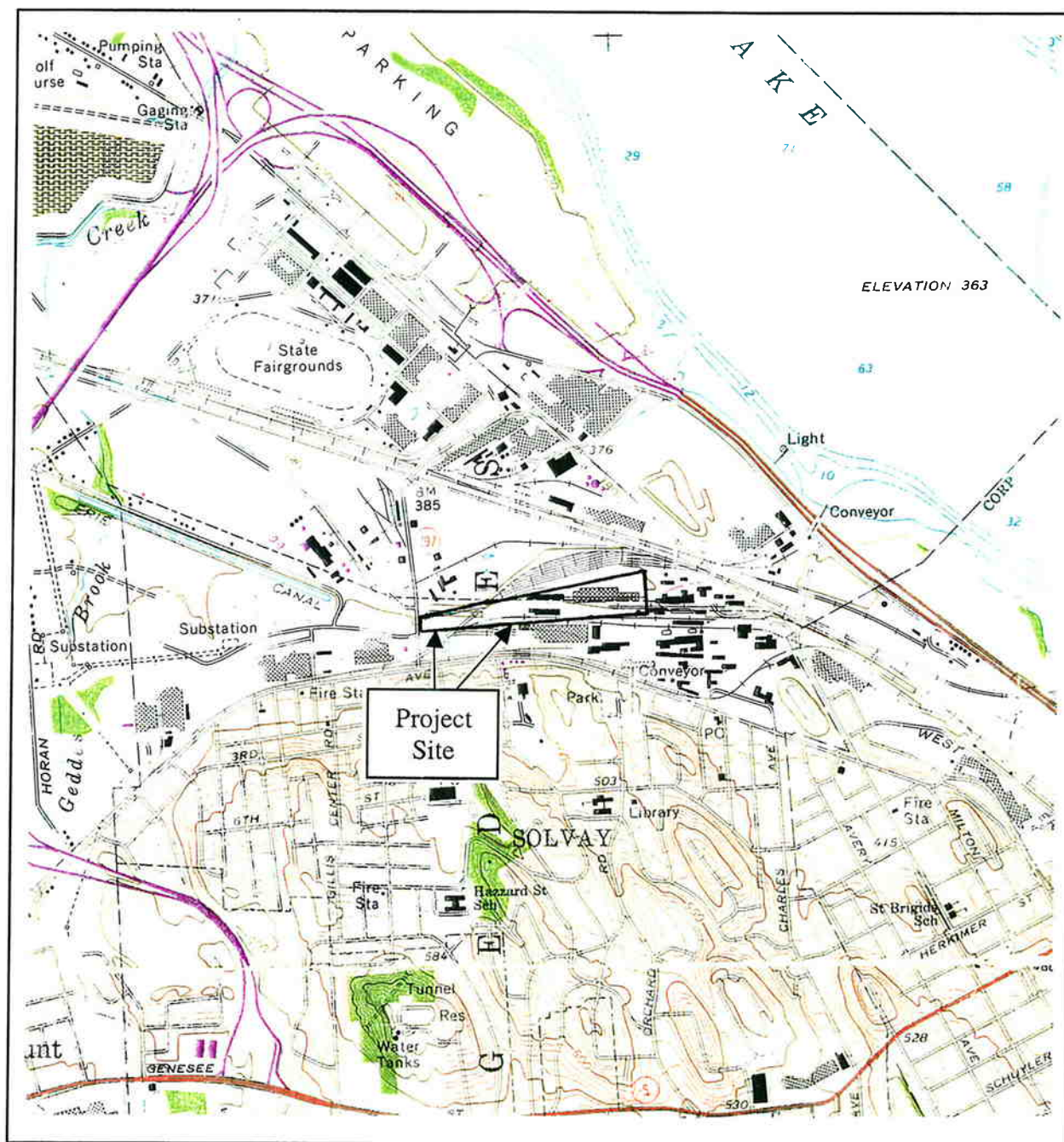
4000 0 4000  
Scale in Feet  
1200 0 1200  
Scale in Meters

Figure 1



TAMS





CONTOUR INTERVAL 10 FEET  
 NATIONAL GEODETIC VERTICAL DATUM OF 1929  
 DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS 363 FEET IN ONONDAGA LAKE

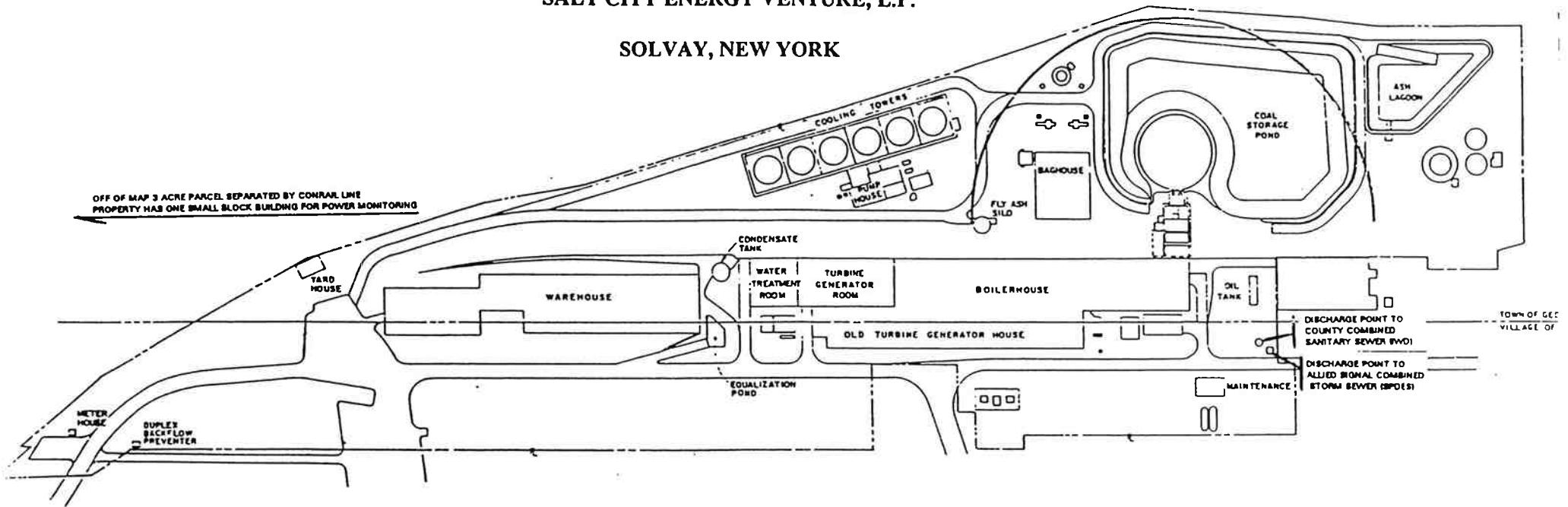
United States Geological Survey  
 Syracuse West Quadrangle  
 Onondaga County, New York

Figure 2

**FIGURE 3**

**SALT CITY ENERGY VENTURE, L.P.**

**SOLVAY, NEW YORK**



Source: Salt City Energy Venture, Mailing No. 1, March 29, 1995, p. 000031



# MAJOR CHANGES FROM 1987 MAP:

1. Mercury cells and Para finishing buildings were dismantled by July 1989. The office building remains on site.
2. Boilerhouse and pumphouse area property was sold to Hydra-Co, Inc. for power generation in December 1989. Hydra-Co currently operates at the site. The calcium chloride storage tanks and calcium chloride plant were dismantled by July 1989.
3. The ammonium chloride plant was dismantled by July 1989.
4. The refined bicarbonate plant was dismantled by Church & Dwight in 1987. Cooperage buildings were dismantled by Allied-Signal in July 1989.
5. The soda ash plant was dismantled by July 1989 and the dense ash plant and loading area will be dismantled by August 1992.
6. The lime kiln, brine storage tank, and several support buildings were dismantled by July 1989.

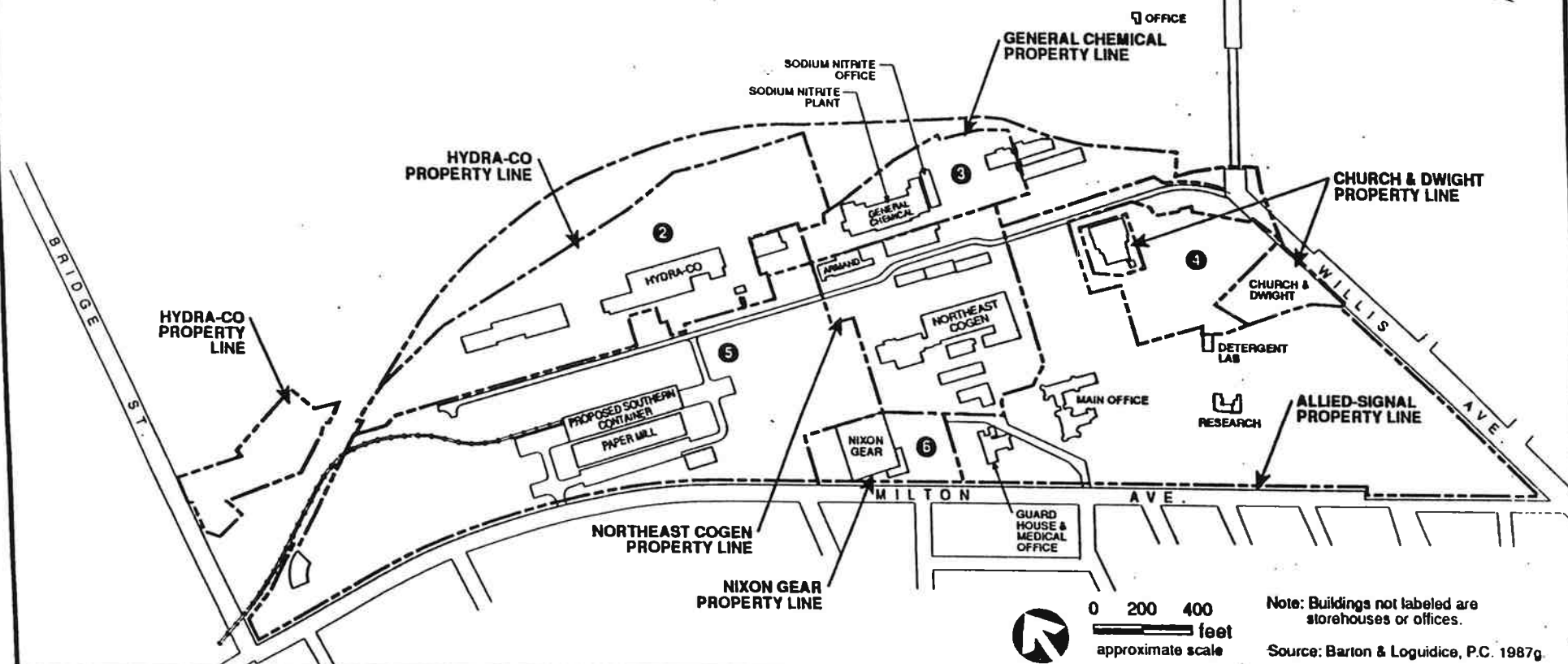


Figure 4 Syracuse Works as of 1992

# MAJOR CHANGES FROM 1954 MAP:

1. Willis Avenue plant was shut down in 1977. All buildings except mercury cell, para finishing, and office building were dismantled in 1980. These buildings were used for calcium chloride and refined bicarbonate of soda product storage.
2. A new ammonium chloride plant was installed in 1961. The sodium nitrite plant was sold to General Chemical in 1985.
3. The snowflake, ammonium carbonate, and refined bicarbonate facilities were sold to Church & Dwight Company, Inc., in 1985.
4. Caustic soda plant was shut down in 1968 and dismantled.
5. Calcium chloride plant was expanded in 1974.
6. A 2-million-gal calcium chloride liquor storage tank was installed in 1974.

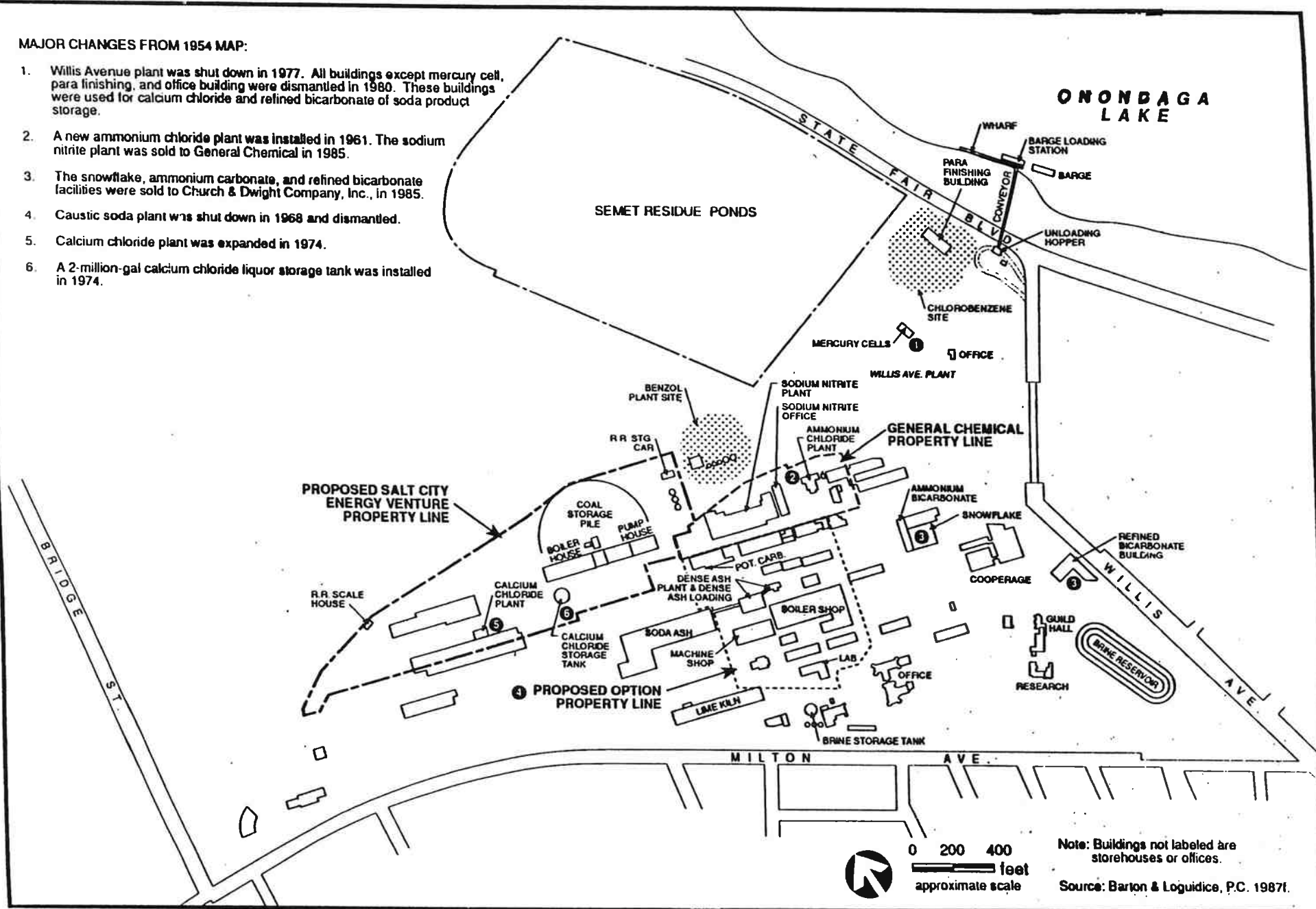


Figure 5 Syracuse Works as of 1987.